REMARKS/ARGUMENT

The application had the 54 claims of the International Application as amended. Those 54 claims have been canceled. Nearly all of them have been replaced with new claims as follows. Claims 55-59 replace claims 1-5, claims 60 and 61 replace claim 6, claims 62 and 63 replace claims 7 and 8, claims 64-78 replace claims 10-24, claims 79-82 replace claims 28-31, and claims 83-101 replace claims 35-53, respectively. Claims 9, 25, 26, 27, 32, 33, 34 and 54 have been canceled without replacement.

References listed at pages 3, 4, 5, 22 and 23 in the specification and for which an Information Disclosure Statement has not been supplied are noted. Copies of relevant ones of those publications are supplied with the Information Disclosure Statement submitted herewith.

With respect to the drawings, what had been identified as the detector 31 at page 32 line 28 and Fig. 15 has been corrected in both locations to the detector 29 to avoid double use of the same character. A proposed drawing correction for Fig. 15 is enclosed with the change in red.

Reference numbers M12" and M21" of Fig. 4 appear in the specification at page 28, as amended.

a1' and am' in Fig. 12 are described in the specification at page 30.

Element 92 in Fig. 13 has been renumbered as element 91 which is described. A proposed drawing correction for Fig. 13 is enclosed and the change is indicated in red.

Concerning the objections to the specification, as to page 22, line 13, a correction has been made consistent with Figs. 1 and 2. As to page 31, line 19, the suggested correction has been made.

The Examiner's requirement that essential material at page 23, lines 3-5 be included in the specification is noted. Reference to corresponding U.S. patent 6,194,735 has instead been provided.

The specification has been reviewed and the few errors therein are corrected herein.

In response to objections to claim wording, the replacement claims, it is submitted, are in proper U.S. form and of the same scope as the claims they replace. It is believed that duplicate successive claims have been avoided in the replacement claims.

Claims 8 and 12 were rejected under 35 U.S.C. § 112 because it was not clear from the specification what parts of the base unit are applied to a structure inside the second cell part or

cover 2A. Reconsideration is requested as to replacement claims 63 and 66. Briefly, conductors and other components on the support base B are outside the second cell part cover when the cover 2A is assembled together with the base 2B, e.g. see Figs. 12 and 13. The electromagnetic wave emitter 1a and its receiver 3 on the base support are outside the cover 2A (Fig. 1). See also p. 24, line 3 of the specification and succeeding passages. But the detector may be on the cover 2A, even if not inside it or inside the gas cell cavity. See page 27, starting at line 8 (third paragraph).

The original claims were rejected under 35 U.S.C. § 112 as being narrative and not being in accordance with U.S. practice. The claims have been rewritten to U.S. form and to overcome the specifically stated grounds of rejection, including apparent inconsistencies and lack of antecedents.

With respect to claim 2, replaced by claim 56, it is clear what is inside and what is outside from Fig. 1 and from the claim. Enclosed here does not necessarily mean inside, although it broadly might cover inside. The detector 3 communicates inside cover 2a through opening 22, whereby the thermal element may be enclosed with the cover 2a. This applies to canceled claim 29 replaced by claim 80. As to claim 18, replaced by claim 72, the original claim has been restated and refers specifically to a structure seen in Fig. 12.

As to claims 15 and 16, replaced by claims 69 and 70, all elements are related to each other for describing cooperation.

As to claims 42 and 43, replaced by 90 and 91, the comments above as to claims 69 and 70 apply.

The original canceled method claims 1-26, which have been replaced, were rejected over a combination of the patents to Peters, in view of Baxter, Grinberg, Matarese and Tsing. Reconsideration is requested as to the replacement method claim.

Claims 27-54, the product claims, which have been replaced, as described at the start of the Remarks hereof, were rejected under 35 U.S.C. § 103 over a combination of Peters, Baxter and Grinberg. Reconsideration of this rejection as to the replacement product claims is requested for the same reasons as reconsideration of the rejection of the method claims is requested.

There are below described reasons why the individual references are not correctly applied here. But the independent claims 55 and 79 are distinguishable from the cited prior art, even if

the art were properly applicable to the claims and the claimed subject matter, in that a topographical structure, as in Fig. 3, is on the base structure 2B and in that a cover 2A encloses the cavity over the base structure. Further, there is base structure area outside the topographical structure that supports components associated with the detector. This combination is not suggested in any of the prior art, however it may be combined.

Peters was cited for showing a detector coacting with a gas sensor for detecting electromagnetic waves. Peters discloses a gas detector using an infrared spectrometer and using the specific absorption of the gas in the infrared spectral range. Further the gas cell includes the use of two concave mirrors (5 and 6) and the IR beam is reflected within the free space, in order to extend the path of the IR beam through the gas, as in the present invention. Peters discloses a gas detector which inputs electromagnetic waves into the detector and determines from the output of the gas cell what is present there. Peters is in a related art but for reasons explained below, Peters does not show or suggest the claimed invention. It is noted that Peters does not describe the IR radiation receivers 8 and 11 besides naming them as possibilities. Although Peters does indicate that a radiation receiver might be a thermopile, there is no present suggestion of applicants' arrangement of the topographical structure on a base structure with a cover thereover or of placement of other components on the base structure, as claimed, and as noted above. It is submitted that the arrangement described at column 2, lines 4-15 in Peters does not describe applicants' base structure with a topographical structure thereon in a cavity enclosed by a cover wherein the topographical structure has metal layers applied to it, as applicants recite in claims 55 and 79. Peters does not disclose how the radiation transmitters or receivers might be supported with reference to components of the gas cell. It is only disclosed that the receivers are outside a slit exit from the cell.

Applicant's topographical structure inside the gas cell and the claimed features of such a structure inside the gas cell are admittedly not suggested in Peters. Recognizing the absence of such teachings in Peters, the Examiner cites several secondary references from quite diverse arts and suggests that these unrelated structures disclosed for several different purposes might be substituted in Peters to render applicant's claims obvious. However, such application of secondary references is contrary to accepted practice. Modification of Peter to include elements from secondary prior art references purports to mix references in diverse unrelated arts without

showing motivation by any of the reference patents, particularly Peters, why the teachings of any of the references from the unrelated arts might be substituted into Peters.

Baxter discloses a thermopile type radiation detector for use in radiation pyrometers. Use as a detector for a gas cell or for directing radiation that has passed through a gas cell is not suggested. Application of Baxter's thermopile to a gas cell is not shown. There is no motivation in either Peters or in Baxter for use of one with the other, nor any need indicated for the use of one in the other. Combination of Baxter with Peters would be unobvious.

Although thermopiles per se are known, as in Baxter, the provision of a topographical structure on a base structure and having metal layers applied, as applicant recites in claims 55 and 79, is nowhere suggested in either Peters or Baxter or Grinberg or any other reference of record. The multipurpose base structure applicant provides not only for the topographical structure but for the circuit arrangement and components associated with the detector is also not suggested in Peters or the other art combined with Peters. Consequently, claims 55 and 79 are distinguishable.

Grinberg discloses an IR simulator using an array of pixels on an insulative substrate by resistor bridges, which contact the substrate at spaced locations. Grinberg relates to simulating infrared images and a detector for electromagnetic radiation which includes infrared and microwave. Grinberg does not suggest its use in association with a gas detector and suggests no motivation as to why Peters might use teachings from Grinberg's IR simulator and no motivation is suggested in Peters for combining into it any of the teachings of Grinberg which is in a completely unrelated art.

Matarese discloses a plurality of parallel, spaced, raised strips provided on a surface of a substrate. Matarese shows application of one metal layer to form electrodes. A single metal evaporation metal application step forms electrodes. There is no suggestion of use in association with a gas detector. There is no motivation to combine any teaching of Matarese into Peters or into any of the other references. There is no indication in Peters (or in the claims of the present application) of single electrodes or of one application of metal at a particular angle in a single metal application step. There is no motivation or reason for combining Matarese with any of the references, no suggestion in any of the other references that the teachings of Matarese would provide any useful structure or method. Since Matarese is in a completely unrelated art to the

present invention and to Peters as well as to the other references purported to be combined with it, it is submitted that the proposed combination of Matarese with the other references would be unobvious and does not properly combine the prior art.

Tsing discloses a thermo electrical transformer, using a plurality in a row connected thermo element related pairs, by using a first (1) and a second (2), as films applied, conductive materials, applied onto a substrate (7). Tsing was cited for showing application of different layers to provide a thermoelectric junction. As is apparent from the drawings in Tsing, the overlaid different elements of metal are bent metal pieces, not metal applied at specified angles to a substrate. The application of metal layers as applicant claims is not suggested in Tsing. There is no suggestion in Tsing of its use in connection with any other elements of any of the other prior art references. There is no motivation to install the electrode arrangement shown in Tsing in place of any other electrode arrangement in any other cited reference. Tsing is for measuring flows, chemical substances or IR radiation and there is no motivation for Tsing to be used in connection with a gas detector.

Although there is no rule that reliance upon a large number of references to reject a claim is some evidence of the unobviousness of the claim, the apparent necessity to rely upon a combination of five references in order to find applicants' original claims obvious over prior art is some indication of the unobviousness of the claims rejected over the combination of so many references. It is submitted that one skilled in the art would not think to check so many references in so many diverse and unrelated field and therefore would not find a combination of these so unrelated references to be obvious or to render the rejected claims obvious. The combining of the references would not have been obvious, but rather is sufficiently unobvious as to make applicants' claims unobvious and patentable over the combined prior art.

The rejected claims additionally are distinguishable from the prior art because even as to replacement claim 55, there is significant distinguishing feature which had been noted in original claim 1 and repeated in replacement better form claim 55 and the claims dependent thereupon.

In particular as to claim 55 there is no suggestion in Peters, the only reference specifically relating to a detector in a gas sensor for detecting electromagnetic waves, of "an electrically non-conductive base structure and <u>forming</u> a topographical structure <u>on</u> the base structure", then "coating the topographical structure with [metal layers]" and "enclosing the gas cell cavity and

the topographical structure having the metal layers thereon with a cover" while "providing circuit arrangements to the detector and components for acting with the detector on the base structure".

The prior art does not show a detector in a gas sensor having all those features, does not show a base structure and a separate cover thereover as claimed, does not show a base structure having a topographical structure on the base structure in a gas detector, with a cover thereover, does not show applying metal layers at respective angles of incidence to a topographical structure in an enclosed gas cell cavity and does not show the additional components supported on the base structure and outside where the topographical structure is disposed. These features mostly can be seen in applicants' Fig. 1, with particulars as to the base structure and the topographical structure and the layers being shown in other drawing Figures. The prior art does not show these various elements discussed in combination with the other steps or elements in claim 55 or the claims dependent thereupon.

The undersigned notes that the Examiner has applied various teaching of the prior art references to different ones of the claims. In view of the distinction between claim 55 and the prior art, it is submitted that consideration of the detailed rejections of the original claims and/or of their replacement claims would not be necessary. Some comment as to particular features in particular claims are provided herein.

The same elements in the method claim 55 with respect to the base structure having a topographical structure in the cavity, a cover over the topographical structure, two metal layers being applied to the topographical structure on the base structure at an angle, the base structure also having areas outside the topographical structure that carry a circuit arrangement and components associated with the detector, are all features that were discussed above in connection with claim 55 and are all features not shown or suggested in Peters nor in any properly made combination of Peters with the secondary references to Baxter or Grinberg or the others. For the reasons discussed above as to claim 55, it is submitted that main product claim 79 is also distinguishable from and unobvious over the combined prior art.

With respect to claims 55 and 79, none of the prior art suggests the application of first and second layers to a base structure at an angle of incidence other than 90° and with respect to claims 57 and 81 which respectively replaced claims 3 and 30, the application of two different

angles of incidence is not suggested in any of the prior art making the applicants' combination claims allowable.

The details of the manner of application of the layers as in claim 67 which replaces claim 13, and claim 88, which replaced claim 40, is not suggested in any of the prior art however it might be combined.

The arrangement of ridges in claim 71 which replaced claim 17, in claim 92 which replaced claim 44 and in claim 93 which replaced claim 45 is not suggested in any of the prior art, including both Baxter and Matarese which show some types of ridges, but not the arrangement of ridges which applicant has claimed. Consequently, not only are the independent claims unobvious for the reasons discussed above, but particular dependent claims have additional clearly distinguishable elements not suggested in the prior art.

In view of the foregoing, it is submitted that independent claims 55 and 79 and the other dependent claims are allowable.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Asst. Commissioner for Patents, Washington, D.C. 20231, on June 11, 2002:

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Name of applicant, assignee or Registered Representative

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Signature

June 11, 2002

Date of Signature

RCF:dmk:ahc:mcm

Respectfully submitted,

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APPENDIX A

"CLEAN" VERSION OF EACH PARAGRAPH/SECTION/CLAIM
37 C.F.R. § 1.121(b)(ii) AND (c)(i)

SPECIFICATION:

Paragraph at page 17, line 29 to page 17, line 33:

Paragraph at page 20, line 15 to page 20, line 17:

B1

The method has been described earlier under the heading "SOLUTION".

Paragraph at page 22, line 13 to page 22, line 21:

B2

In the Figure 2 embodiment, the surfaces 21C, 21D and 21E of Figure 1 that form the wall parts within the gas cell 2, or at least a part of said surfaces 21C, 21D and 21E, are usually coated with two different metal layers M1, M2 that consist of a selected first metal in a first layer M1, and a selected second metal in a second layer M2, this second layer being intended to form a highly reflective surface with respect to said light rays 4, therewith enabling practically loss-free reflections to be achieved.

Paragraph at page 22, line 34 to page 23, line 5:

B3

International Patent Application PCT/SE96/01448, with Publication No. WO 97/187460, and the International Patent Application PCT/SE97/01366, with Publication No. WO 98/09152, disclose examples of earlier known gas sensors in which incoming light rays are repeatedly reflected within the cavity in accordance with a predetermined pattern. International Patent Application PCT/SE97/01366 corresponding to U.S. Patent 6,194,735 is considered to constitute part of this description.

B4 [Paragraph at page 26, line 21 to page 26, line 22:]

Figure 7 shows that the base unit 31 may consist of a discrete or separate component and applied to the first part 2A.

Paragraphs at page 28, line 4 to page 28, line 23:

B5

The first angle "b" shall be adapted so that the first side surface 5a and at least a part of the upper surface 5c of respective conductive ridges 5, 5', 5", and at least a part of the intermediate conductive surfaces 6 will be coated with the first metal layer M1, and the second angle "c" shall be adapted so that the second side surface 5b and at least a part of the upper surface 5c of respective conductive ridges 5, 5', 5", and at least a part of the intermediate conductive surfaces 6 will be coated with the second metal layer M2, in accordance with Figure 4.

The first and second angles "b", "c" shall be adapted so that the second metal layer overlaps the first metal layer M1 on the upper surface 5c of respective conductive ridges 5, 5' and on the intermediate conductive surfaces 6, 6' so as to form an electric contact with M12, M21, and so that the metal layers M1, M2 will form a series of electrically coupled ridges or transitions M12, M12', M12", M21, M21', M21", between the first and the second metals.

Paragraph at page 30, line 12 to page 30, line 15:

B6

Figure 12 illustrates an embodiment in which the electric interconnection 51 between two ridges of two mutually adjacent column k1, k2 can be effected by forming an electrically conductive surface section 51' as said interconnection. This joins the ridges like am' and al' in Figure 12 in the manner described above for ridges am and a1 as shown in Figure 11.

Paragraph at page 31, line 17 to page 31, line 20:

B7 According to one preferred embodiment of the invention, the heat-absorbent coating 55 is comprised of a layer of carbon, whereas the heat-reflecting layer 56 is comprised of the reflective metal layers M1, M2.

Paragraph at page 32, line 24 to page 32, line 30:

B8 It will also be understood that a gas cell can be provided or allocated with a plurality of detectors, within the concept of the invention. This possibility is illustrated in Figure 15, in which the first part 2A includes integrally two or more different detectors 29, 32, and/or by providing the second part 2B or further second parts with one or more detectors 33, 34.

CLAIMS (all new):

B9

55. A method for forming a detector, using a gas sensor, for detecting electromagnetic waves passing through a gas cell, the method comprising:

forming said gas cell, to define a cavity for enclosing a volume of gas to be measured or evaluated;

forming a surface within said gas cell, including at least one metal layer, which is highly reflective for (of the) electromagnetic waves;

providing an electrically non-conductive base structure for the detector, and shaping said base structure to define one part of said gas cell;

forming a topographical structure on said base structure;

applying onto said topographical structure a first electrically conductive metal layer, by applying said metal layer to said base structure from a direction with an angle of incidence to said base structure at other than 90° and by applying onto said topographical structure a second electrically conductive metal layer to said base structure at an angle of incidence other than 90°, respectively, forming said first and second metal layers onto said topographical structure of said non-conductive base structure such that the first and second electrically conductive metal layers together define a thermal element of the detector;

enclosing said gas cell cavity by placing a cover over said base structure in a manner to expose the topographical structure inside the enclosure of the gas cell cavity; and

positioning circuit arrangements to the detector and components for acting with said detector on an outside area of the base structure, outside the topographical structure and outside the enclosure of the gas cavity.

B9 cont

56. The method of claim 55, further comprising enclosing said thermal element by the cover and arranging components, comprising an electromagnetic wave generating element, on the outside area, for directing electromagnetic waves into said cavity and an electromagnetic wave receiving device, on the outside area of said cavity for receiving electromagnetic waves from inside said cavity.

RC

57. The method of claim 55, wherein onto first surface regions of the topographical structure are applied said first metal layer, applied to the first surface regions at a first angle of incidence other than 90°, to the surface structure, and onto second surface regions of the topographical structure are applied said second metal layer to the second surface regions of the topographical structure at a second angle of incidence other than 90° to the surface structure, such that the first and second metal layers are applied such that the first and second layers are overlapped at discrete surface parts of the detector.

58. The method of claim 57, wherein said first and second metal layers are comprised of respective metals which, when the first and second metal layers are overlapped, perform the function of a thermocouple at the discrete surface parts of the detector.

RC

59. The method of claim 55, wherein there is a limited surface region of the base structure, which is less than the entire surface region of the base structure;

the method further comprising applying said detector on the limited surface region, and applying required electric conductors or electric circuits to the thermal element on the limited surface region.

60. The method of claim 55, further comprising producing said base structure by topographically shaping the base structure against a die or mold, that exhibits a complementary topographical structure to the topographical structure.

B9 cont.

61. The method of claim 60, further comprising producing at least part of the die or mold, that produces the topographical structure shaping, by a plating process on a model that includes a topographical structure adapted to the structure for the detector.

B3

62. The method of claim 55, further comprising producing the base structure by a shaping operation against a die or a mold, having a complementary topographical structure for defining the topographical structure of the base structure in the cavity;

forming the mold for the shaping operation by mechanically working a substrate, wherein the configuration of the substrate is complementary with respect to the topographical structure to be formed.

63. The method of claim 55, wherein the gas cell cavity is enclosed with a cover, the method further comprising applying parts of the detector on said cover and inside the cavity.

B4

64. The method of claim 55, wherein onto the surfaces in the gas cell are applied with the same metals as applied onto the topographical structure associated with the detector at the same time.

65. The method of claim 55, wherein the topographical structure is shaped so that applying said metal layers provides connection pads to said detector, electric conductors and circuits for the components before the detector, in addition to providing the metal layers of the detector.

66. The method of claim 63, further comprising forming electric conductors and electric circuit parts for the detector in the cover.

67. The method of claim 57, further comprising forming the topographical structure of the detector to include a number of ridges, spaced apart from each other, each ridge having opposite first and second side surfaces and an upper surface, and a respective intermediate conductive surface defined between adjacent ridges;

B9 Cont.

the first angle of incidence of applying the first conductive layer is selected so that the first side surface and at least part of the upper surface of each of the ridges and at least part of the intermediate conductive surfaces between adjacent ridges are coated with the first layer; the second angle of incidence of applying the second conductive layer is selected so that the second side surface and at least part of the upper surface of each of the ridges and at least part of the intermediate conductive surfaces between adjacent ridges are coated with the second layer; wherein the first and second angles of incidence are selected so that the first and second metal layers overlap and form electric contact with each other on the upper surfaces of the ridges and also on the intermediate conductive surfaces between adjacent ridges, causing the metal layers to form a series of electrically interconnected junctions between the first and the second metal layers.

~~68. The method of claim 67, further comprising positioning the supply of incident electromagnetic waves with respect to the locations of the ridges such that incident electromagnetic waves irradiate the upper surfaces of the ridges and such that the intermediate conductive surfaces between ridges are shaded against incident electromagnetic waves by the ridges.~~

~~69. The method of claim 67, further comprising forming electrically insulated surface sections between adjacent ridges and with the intermediate conductive surfaces and also surrounding surface sections of the base structure.~~

~~70. The method of claim 69, further comprising electrically insulating the insulated surface sections between adjacent ridges by positioning insulating ridges with adjacently located insulating surfaces relative to the conductive ridges and relative to the first and second angles of~~

incidence to exclude coating of both of the first and the second metal layers on the insulating surface sections.

B9 cont.

71. The method of claim 67, comprising arranging the conductive ridges in a configuration forming "n" number of columns of ridges with "m" number of ridges in the columns, wherein "m" may be a different number in respective ones of the columns, such that the first ridge in each column except for the "nth" column and the "mth" ridge in each column except for the "nth" column form an interconnecting ridge, wherein the "mth" ridge in each column except the "nth" column is connected to the first ridge of the next following column, such that the resultant junctions, between the first and second metal layers on all of the conductive ridges in all of the columns, form a series of electrically interconnected junctions.

72. The method of claim 71, further comprising forming the electrical interconnection between an "mth" ridge in a column and a ridge in an adjacent column comprises forming an electrically conductive surface section between the adjacent columns such that the conductive surface is electrically connected to interconnecting ridges belonging to the adjacent columns while being otherwise insulated from the adjacent columns.

73. The method of claim 67, wherein the conductive ridges together form a series connected thermocouple and the intermediate layer on one of the side surfaces of a ridge or a conductive surface adjacent to the ridge in a series of the ridges forms a first thermocouple connecting electrode and a first or second side surface of a last conductive ridge or a conductive surface adjacent the last conductive ridge in a series of the conductive ridges forms a second thermocouple connecting electrode.

74. The method of claim 67, further comprising covering the upper surfaces of the conductive ridges with a heat absorbing layer and covering the intermediate conductive surfaces between the ridges with a heat reflecting layer.

75. The method of claim 74, wherein the heat absorbing layer is comprised of carbon

and the heat reflecting layer is comprised of a metal layer.

B9 Cont.

76. The method of claim 68, wherein the metal of one of the metal layers has a first reflection coefficient in relation to the electromagnetic waves and that the metal of the other of the metal layers has a second reflection coefficient in relation to the electromagnetic waves; and the conductive ridges are so shaped and located in their positions relative to the incident electromagnetic waves that the metal layer with the lowest one of the first and second reflection coefficients covers the side surfaces that face the incident electromagnetic waves, and the method comprising positioning the metal layer of lowest reflection coefficient to face the incident electromagnetic waves.

77. The method of claim 67, wherein the first and second metal layers are of different metals to obtain a thermoelectric effect between the first and the second metal layers.

78. The method of claim 76, wherein the first and second metal layers are respectively comprised of gold which covers chromium.

79. A detector using a gas sensor, intended for detecting electromagnetic waves passing through a gas cell:

said gas cell comprising an enclosure, defining a gas cell cavity, for enclosing a volume of gas to be evaluated; a surface within said enclosure is applied with at least one metal layer for forming a highly reflective surface with regard to electromagnetic waves;

an electrically non-conductive base structure also defining the enclosure and having a topographical structure in the cavity, which is applied with a first and a second electrically conductive metal layer, and the metals of the layers act together to form a thermal element; the first and second conductive metal layers are applied onto the topographical structure at locations corresponding to locations wherein each of the first and second metal layers have been applied to the topographical structure at an angle of incidence to the topographical structure other than 90°;

the enclosure further comprising a cover, that encloses the cavity and the part of the base structure in the cavity, and that exposes the topographical structure; and

the base structure having an outside area outside the topographical structure, and said outside area carrying a circuit arrangement and components associated with the detector.

39 cont.

80. The detector of claim 79, wherein the cover encloses said thermal element; and the circuit arrangements for the conductive metal layers being located outside a second cover part and including an electromagnetic wave generating device, for generating electromagnetic waves into the enclosure, and an electromagnetic receiving device disposed for receiving electromagnetic waves from said enclosure.

81. The detector of claim 79, wherein the first metal layer is positioned on portions of the topographical structure which receive the first metal layer applied to the topographical structure at a first angle of incidence other than 90° and the second metal layer is positioned on portions of the topographical structure which receive the second metal layer applied to the topographical structure at a second angle of incidence other than 90° and different that the first angle, whereby the first and second metal layers mutually overlap on discrete surface parts of the topographical structure.

82. The detector of claim 81, wherein the first and second metal layers are comprised of respective metals which function as a thermocouple at the discrete surface parts where they overlap.

83. The detector of claim 79, wherein the base structure on which the topographical structure is formed is applied to a surface of the cover.

84. The detector of claim 79, wherein the base structure on which the topographical structure is formed is an integral part, and the detector associated surface parts form an integral part of the inner surface of the cavity.

85. The detector of claim 79, wherein the interior of the cavity is coated with the same metal as the topographical structure of the detector.

B9 cont.

86. The detector of claim 79, wherein the topographical structure is shaped for providing connection pads to the detector, electric conductive paths and circuitry to the metal layers.

87. The detector of claim 83, further comprising an electric conductor path and electric circuits to the detector which are formed in the cover.

B10

88. The detector of claim 81, wherein the topographical structure comprises a plurality of conductive ridges up from the surface of the base structure, each conductive ridge having a first side surface, a second side surface different from the first side surface, and an upper surface facing out of the base structure on which the topographical structure is positioned; an intermediate conductor surface located between adjacent ones of the conductive ridges;

the metal layers being disposed on the surfaces in a manner such that the first angle of application of the ~~first~~ metal layer is selected to coat the first side surfaces and at least part of the upper surface of the conductive ridges and at least a part of the intermediate conductive surface between the ridges with the first metal layer, and the second angle of application of the second metal layer is selected to coat the second side surfaces and at least part of the upper surface of the conductive ridges and at least a part of the intermediate conductive surfaces between the ridges with the second metal layer, and so that the first and second metal layers overlap and provide electric contact on the upper surface of the conductive ridges and on the intermediate conductive surfaces between the conductive ridges, whereby the metal layers form a series of electrically interconnected junctions between the first and second metal layers.

89. The detector of claim 88, wherein the topographical structure including the ridges are positioned relative to incident electromagnetic waves so that the waves irradiate the upper surfaces of the ridges but the ridges shadow the intermediate conductive surfaces against incident electromagnetic waves.

90. The detector of claim 88, further comprising electrically insulated surface sections defined between the ridges at the intermediate conductive surfaces and also on surrounding surface sections of the base structure around the topographical structure.

91. The detector of claim 90, wherein the electrically insulated surface sections comprise electrical insulating ridges including respective insulating surfaces disposed relative to each other, relative to the conductive ridges with the conductive surfaces and relative to the first and second angles of application of the metal layers, so as to exclude application of both the first and the second metal layers on the insulating surfaces for providing electrical insulation within the detector.

92. The detector of claim 88, wherein the ridges are configured and arranged on the base structure to form "n" number of columns of the ridges and each of the columns including "m" number of ridges, wherein the number "m" of ridges can differ in respective ones of the columns;

a first one of the ridges in each of the columns, except the "nth" column and except the "mth" ridge within each column, but not the "mth" ridge of the last column, form interconnecting ridges, and the "mth" ridge in each column, except for the last column, is connected electrically with the first ridge of the next following column for causing the junctions between the first and second metal layers at all the ridges in all the columns of the ridges to form a series of electrically interconnected junctions.

93. The detector of claim 92, further comprising an electrically conductive surface section between adjacent columns of the ridges for providing the electrical interconnection between an "mth" ridge of a column and a first ridge in an adjacent column; the conductive surface section being electrically connected with interconnecting ridges in adjacent columns.

94. The detector of claim 88, wherein the series of conductive ridges forms a series connected thermocouple; the metal layer on a first or second side surface of a first ridge or a conductive surface adjacent the first ridge in the series of ridges forms a first thermocouple

connecting electrode and a first or second side surface of a last ridge or a conductive surface adjacent the last ridge in the series of ridges forms a second thermocouple connecting electrode.

B9 cont'd

95. The detector of claim 88, further comprising a heat absorbent layer covering the upper surface of each of the ridges; and

a heat reflecting layer covering the intermediate conductive surfaces between adjacent ridges.

96. The detector of claim 95, wherein the heat absorbing layer is a layer of carbon and the heat reflecting layer is comprised of a metal layer.

97. The detector of claim 89, wherein one of the two metal layers has a first reflection coefficient with respect to the electromagnetic waves and the second metal layer has a second reflection coefficient with respect to the electromagnetic waves; parts of the detector are positioned relative to the incident electromagnetic waves and the metal layers and the conductive ridges are so positioned that the metal having the lowest of the first and second reflection coefficients covers the side surfaces of the ridges that face the incident electromagnetic waves.

98. The detector of claim 81, wherein the metals of the first and second metal layers are different to obtain a thermoelectric effect between the first and second metal layers.

99. The detector of claim 98, wherein the first and second metal layers respectively comprise gold covering chromium.

100. The detector of claim 79, wherein the first of the base structure includes a surface section for receiving at least two of the detectors.

101. The detector of claim 79, wherein the cover includes a surface for receiving at least one of the detectors.

APPENDIX B

VERSION WITH MARKINGS TO SHOW CHANGES MADE

37 C.F.R. § 1.121(b)(iii) AND (c)(ii)

SPECIFICATION:

Paragraph at page 17, line 29 to page 17, line 33:

[The primary characteristic features of an inventive method are set forth in the characterising clause of the following Claim 1, while the primary characteristic features of an inventive detector are set forth in the characterising clause of the following Claim 26.]

Paragraph at page 20, line 15 to page 20, line 17:

The method has been described earlier under the heading "SOLUTION" [and is described more succinctly in the following method claims].

Paragraph at page 22, line 13 to page 22, line 21:

In the Figure 2 embodiment, the surfaces 21C, 21D and 21E <u>of Figure 1</u> that form the wall parts within the gas cell 2, or at least a part of said surfaces 21C, 21D and 21E, are usually coated with two different metal layers M1, M2 that consist of a selected first metal in a first layer M1, and a selected second metal in a second layer <u>M2</u> [M1], this second layer being intended to form a highly reflective surface with respect to said light rays 4, therewith enabling practically loss-free reflections to be achieved.

Paragraph at page 22, line 34 to page 23, line 5:

International Patent Application PCT/SE96/01448, with Publication No. WO 97/187460, and the International Patent Application PCT/SE97/01366, with Publication No. WO 98/09152, disclose examples of earlier known gas sensors in which incoming light rays are repeatedly reflected within the cavity in accordance with a predetermined pattern. International Patent Application

PCT/SE97/01366 corresponding to U.S. Patent 6,194,735 is considered to constitute part of this description.

Paragraph at page 26, line 21 to page 26, line 22:

Figure 7 shows that the base unit 31 may consist of a discrete or [of] separate component and applied to the first part 2A.

Paragraphs at page 28, line 4 to page 28, line 23:

The first angle "b" shall be adapted so that the first side surface 5a and at least a part of the upper surface 5c of respective conductive ridges 5, 5', 5", and at least a part of the intermediate conductive surfaces 6 will be coated with the first metal layer M1, and the second angle [angel] "c" shall be adapted so that the second side surface 5b and at least a part of the upper surface 5c of respective conductive ridges 5, 5', 5", and at least a part of the intermediate conductive surfaces 6 will be coated with the second metal layer M2, in accordance with Figure 4.

The first and second angles "b", "c" shall be adapted so that the second metal layer overlaps the first metal layer M1 on the upper surface 5c of respective conductive ridges 5, 5' and on the intermediate conductive surfaces 6, 6' so as to form an electric contact with M12, M21, and so that the metal layers M1, M2 will form a series of electrically coupled ridges or transitions M12, M12', M12", M21, M21', M21", between the first and the second metals.

Paragraph at page 30, line 12 to page 30, line 15:

Figure 12 illustrates an embodiment in which the electric interconnection 51 between two ridges of two mutually adjacent column k1, k2 can be effected by forming an electrically conductive surface section 51' as said interconnection. This joins the ridges like am' and al' in Figure 12 in the manner described above for ridges am and a1 as shown in Figure 11.

Paragraph at page 31, line 17 to page 31, line 20:

According to one preferred embodiment of the invention, the heat-absorbent coating 55 is comprised of a layer of carbon, whereas the <u>heat-reflecting layer</u> [heat-absorbent coating] 56 is comprised of the reflective metal layers M1, M2.

Paragraph at page 32, line 24 to page 32, line 30:

It will also be understood that a gas cell can be provided or allocated with a plurality of detectors, within the concept of the invention. This possibility is illustrated in Figure 15, in which the first part 2A includes integrally two or more different detectors <u>29</u> [31], 32, and/or by providing the second part 2B or further second parts with one or more detectors 33, 34.